AHPS – Monitoring Our Waters From Drought to Flood

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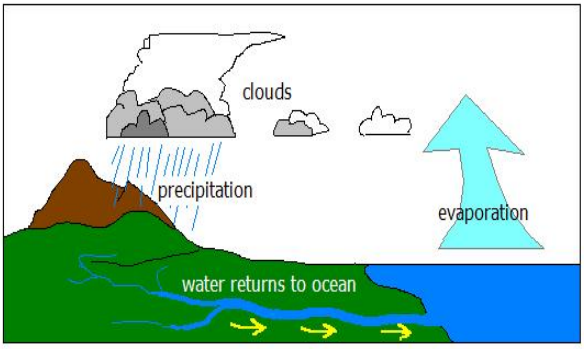
Remember learning about the Water Cycle in your school days way back when? Water evaporates from the oceans, forms clouds, falls as rain or snow, and then returns to the ocean through rivers. Most folks are quite familiar with the clouds and precipitation parts of the Water Cycle. When your National Weather Service (NWS) office in Glasgow puts together these parts of your weather forecast, we deal primarily with the science of Meteorology. We predict what kind of precipitation will fall, and how much.

But what happens to the water (frozen or liquid) after it falls from the sky? That's where another science enters the picture: Hydrology. In other words, that last leg of the Water Cycle; when water makes its way back into rivers and progresses eventually into the oceans. Trust me, this is a lot more complicated than it sounds!



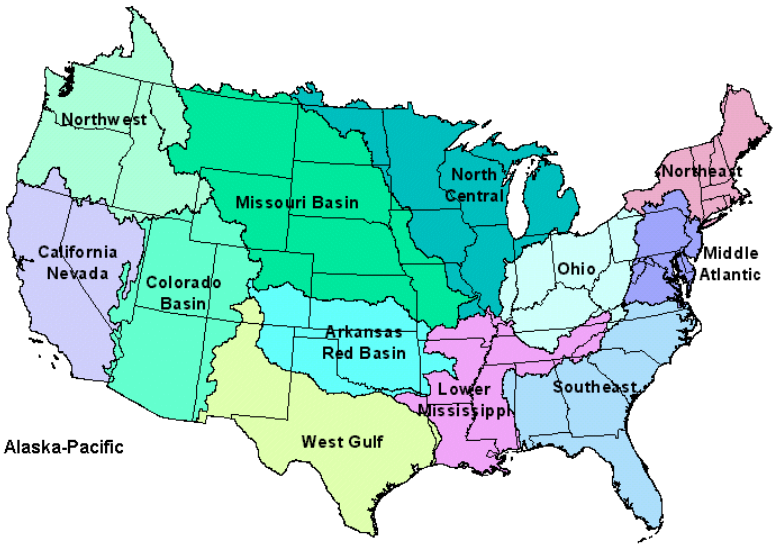
SIMPLIFIED VERSION OF WATER CYCLE

A large river basin can be broken down into many sub-basins, and beyond that a myriad of small streams and tiny creek beds. And whether you are talking about main stem rivers or creeks, there are a wide variety of soil and terrain types. Each type handles water in different ways. Sandy soil, for example, can soak up quite a lot of water. Then there is clay, which is not nearly as able to accommodate extra water.

The time period from late Winter to early Spring adds additional factors. Frozen soil allows water from rain or snowmelt to quickly run off and cause rapid rises in water levels. There are also ice jams, which the city of Glendive and other parts of Northeast Montana know all too well. Then you have man-made complications such as the Fort Peck Lake, a rather large additional piece to the hydrologic puzzle.

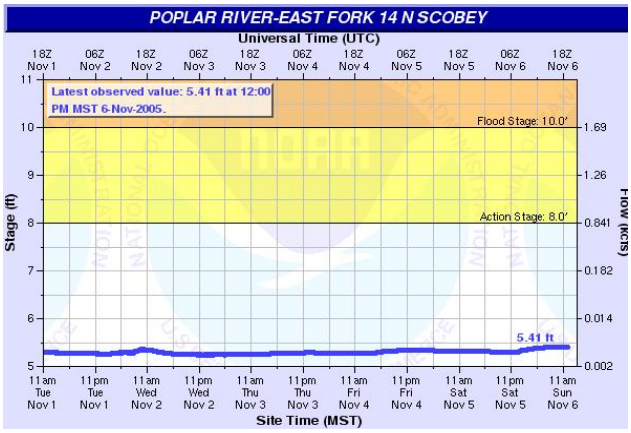
Recently, there has been an exciting development within the NWS to better serve you, our customers: the **Advanced Hydrologic Prediction Service**, or AHPS. You could say it represents the fusion of Hydrology and Meteorology into Hydrometeorology. While you can get your weather forecast from our NWS webpage, you can also access our local AHPS page to find out the expected impacts of the predicted weather on our water levels.

The NWS has thirteen different River Forecast Centers to forecast water levels of rivers across the country. Northeast Montana is served by the Missouri Basin River Forecast Center (MBRFC) near Kansas City, MO. Just as your Glasgow NWS Weather Forecast Office uses computer models to forecast the weather, the MBRFC utilizes hydrological models to forecast water levels, and diagnose the potential for river flooding. It also provides guidance to your local NWS forecasters as to how much rain could lead to flash flooding. Meanwhile, precipitation forecasts produced here at the Glasgow Weather Forecast Office, are fed as data into the MBRFC computer models which adjust the expectations for water levels of our rivers. Other information, such as radar-estimated precipitation and reports from our co-op observers, also serves as model input.



Through AHPS, The MBRFC and your Glasgow Weather Forecast Office work in tandem to provide you with advance notice to take action, whether in times of rising water or drought. Emergency management officials at local and state levels use these forecasts to fight floods, evacuate residents, and to take other measures to mitigate the impact of flooding.

Our local AHPS website details past and current water levels for about twenty different points across Northeast Montana. These include sites on the Missouri, Yellowstone, Milk, Musselshell, and Poplar Rivers. You can also see the forecast river stages for some of the points, depending on the time of year. Customizable graphs illustrate current water levels compared to flood stage and historical flood crests. There are descriptions of what impacts occur to the surrounding area as threshold levels are reached. Close-up maps show the location for each specific gage site. You can even access photos for many of the sites.



We are continuing to work on enhancing the Advanced Hydrologic Prediction Service (AHPS). The NWS has partnered with the National Drought Mitigation Center (NDMC) to collect low river level impact information for up to 46 forecast points on the Upper Missouri River and its tributaries throughout Montana and Wyoming. This effort will involve talking to folks ranging from the Corps of Engineers and Fish Wildlife & Parks, to irrigators and waste water treatment operators about the effects of low river levels (drought). These studies will advance the development of the AHPS system through providing more detailed information that can be used in a wide variety of water resource planning applications at all levels of government. As soon as Spring 2006, it is expected that NDMC personnel will visit the Missouri River area upstream of Williston, ND to begin gathering this data.

Please visit the Glasgow Weather Forecast Office website and have a look around the AHPS page. We hope that you will be pleased by the amount of information you can get with the click of a mouse!

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